SECTION 634 WOOD AND TUBULAR STEEL SIGN POSTS

634.1 Description

(1) This section describes furnishing and erecting wood and tubular steel posts to support signs.

634.2 Materials

634.2.1 Wood

(1) Furnish posts conforming to 507.2.2 for lumber and timber, of the dimensions the plans show, and having 4 sides surfaced (S4S). Use either beam and stringer grade or structural joist and plank grade material with a minimum stress grade rating of 1200 fb (8280 kPa) at 19 percent maximum moisture.

(2) Select posts from one of the softwood species listed for sawed posts for beam guard in 614.2.4.1.

(3) Pressure treat posts conforming to 507.2.2.6 using chromated copper arsenate solution.

634.2.2 (Vacant)

634.2.3 (Vacant)

634.2.4 (Vacant)

634.2.5 Tubular Steel

634.2.5.1 General

(1) Furnish tubular steel sign post assemblies consisting of 3 telescoping square steel tubes as follows:

1. Breakaway upper tube for mounting the sign.
2. Inside anchor tube.
3. Outside anchor tube.

(2) Fabricate the tubular components using structural quality 12-gauge strip steel conforming to ASTM designation A570, grade 50 with an average minimum yield strength, after cold-forming, of 55 000 psi (380 MPa). Punch holes on all 4 sides for the full length as the plans show. Provide corner radii of approximately 5/32 inches (4 mm) and conform to other dimensions and tolerances as follows:

COMPONENT DIMENSIONS AND TOLERANCES[1]

COMPONENT	OUTSIDE DIMENSIONS inches (mm)	OUTSIDE DIMENSION TOLERANCE inches (mm)	ALLOWABLE TWIST[2] inches/3 feet (mm/m)
UPPER TUBE	2.00 x 2.00 (50 x 50)	+/-0.008 (0.200)	+/-0.062 (1.570)
INSIDE ANCHOR TUBE	2.25 x 2.25 (56 x 56)	+/-0.010 (0.300)	+/-0.062 (1.570)
OUTSIDE ANCHOR TUBE	2.50 x 2.50 (63 x 63)	+/-0.010 (0.300)	+/-0.075 (1.910)

[1] Measure at least 2 inches (50 mm) from the ends of the tubes.

[2] Hold one side on a flat surface plate and measure the twist at the corner 3 feet away.

(3) Hot-dip galvanize each tube according to ASTM A653 grade 90. Treat corner welds and cut ends with cold-galvanized organic zinc paint as manufacturer recommends.

(4) The engineer will inspect sign post assemblies before installation. Ensure that the assemblies fit together without damaging the coatings. Replace scratched or otherwise damaged components at no expense to the department.

634.2.5.2 Upper Tube

(1) Furnish upper tubes fabricated to the lengths the plans show. If the plans show colored stock clean and phosphate before painting with an acrylic paint using an electrodeposition process followed by baking.

634.2.5.3 Anchor System

(1) Assemble the anchor system, consisting of the inner and outer anchor tubes, as the plans show with a 3 inch (76 mm), grade 5 zinc plated bolt and nut. Ensure the holes of the 2 tubes match. For installations in poured concrete use an 18-inch (457 mm) inner tube and an 18-inch (457 mm) outer tube with no soil stabilization fins. For other installations use a 36-inch (914 mm) inner tube and an 18-inch (457 mm) outer tube with soil stabilization fins.

634.3 Construction

634.3.1 Wood Posts

(1) Set and laterally position the wood posts for supporting roadside signs as the plans show, or as the engineer directs. For installations in concrete or asphalt, use 12-inch (300 mm) inside diameter PVC pipe box outs. Position the PVC pipe so the top of pipe is flush with the adjacent concrete or asphalt. Install the post in the center of the box out.

(2) Upon adequate advance request from the contractor, the engineer will establish and stake the location for the sign, and establish the pavement elevation if the finished pavement is not in place.

(3) Erect posts in a true vertical position. Excavate the holes for posts to the depths and at the locations the plans show, or as the engineer directs. After positioning the post in the hole, backfill the hole with the excavated material. Place and compact this material in 6-inch (150 mm) layers.

(4) The contractor shall not paint wood posts for signs.

(5) Remove and dispose of all excess excavation, surplus material, and debris resulting from the installation, and repair and restore all other work damaged by installation operations.

634.3.2 Tubular Steel Sign Posts

(1) Obtain the engineer's approval and locate all underground facilities before installing the tubular steel sign post assemblies. Install assemblies oriented to the direction of traffic as the plan details show to ensure that the system meets the yielding breakaway design requirements. Locate assemblies where the plans show or where the engineer directs. Do not install until the finished grade is established.

(2) Install either a 18-inch (450 mm) or 36-inch (900 mm) anchor system as follows:

1. For poured concrete installations at least 4 inches (100 mm) thick, use the 18-inch (450 mm) anchoring system. Wrap the anchor with tape to prevent concrete from plugging the anchor.
2. For other installations, use the 36-inch (900 mm) anchoring system. For installations in hardened concrete do one of the following:
    2.1 If the plans show 12-inch (300 mm) by 12-inch (300 mm) box outs, install in the center of the box.
    2.2 The contractor may core the concrete with a 3 1/2 inch (89 mm) minimum diameter hole. Grout in the anchor using a quick set cement.

(3) Install all anchor sections so that a length of one to 2 inches (25 - 50 mm) remains above the finished grade. Leave one hole of the anchor system exposed 1 inch (25 mm) above grade for connecting the upper tube with a 3/8-inch (9.5 mm) zinc plated corner bolt and nut.

(4) Attach the required sign panels as the plans show or as the engineer directs. Mount the signs on the upper tube with the end 1/2 inch (13 mm) lower than the top of the sign. Place the entire tubular steel sign post assembly in a true vertical position and correctly align for proper visibility for the direction of traffic. Cut upper tubes to provide the sign height the plans show or the engineer directs. Treat all exposed post surfaces after installation with cold-galvanized organic zinc paint according to the manufacturer's instructions.

634.4 Measurement

(1) The department will measure the Posts Wood bid items as each individual post acceptably completed.

(2) The department will measure the Posts Tubular Steel bid items as each individual post assembly, including each section and anchor, acceptably completed.

634.5 Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
634.0400 - 0699	Posts Wood (size) (length)	EACH
634.0800 - 0899	Posts Tubular Steel (size) (length)	EACH

(2) Payment for the Posts Wood bid items is full compensation for providing, hauling, and placing the posts; for excavating and backfilling post holes; and for removing and disposing of surplus material.

(3) Payment for the Posts Tubular Steel bid items is full compensation for providing, hauling, and placing the posts; treating cut post ends; and providing hardware and anchors. The department will not pay for replacing damaged posts or upper tube cut-offs.